

Evolving Multi In One -ECLIPSE 98 model-

Evolving "Multi-In-One" ~ECLIPSE 98 MODEL~

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Abstract

In the domestic commercial market, new media are penetrating, and user demands are becoming more diversified and complicated. In addition, the design, including the display part, is an important point when purchasing products, and the cost performance is high. products are desired.

In the future, we will focus on the man-machine interface that will enable us to operate products that have become diversified and complicated in a simple and easy-to-understand manner. It is thought that the chase will become even more important.

In order to meet these demands, we have developed 98 models of ECLIPSE. and introduce it.

Abstract

In a domestic after market, the infiltration of new media products advances, and the demand of the user is becoming complex and diversifies more and more. Moreover, the design including the display and cost performances become important in purchasing the products.

In the future, the products which become complex by satisfying a diversity of users, can be easily and comprehensibly operated. So, "Human-machine interface" becomes more important.

To satisfy these demands, the "ECLIPSE" model group of 1998 was released. We introduce the outline, a characteristic, and a main technology of the new "ECLIPSE".

1. Introduction

The commercial car AVN (audio, visual, navigation) market is becoming more and more competitive with the launch of new media such as MD and DVD and vehicle information services.

From the spring to the fall of 1997, we launched the "ECLIPSE97 model" for the domestic consumer market. Products that make full use of technology have been well received.

Since the "ECLIPSE98 model" was developed this time, I would like to explain the aim of the development, the outline and characteristics of the new product, and the technical points, and report it.

2. ECLIPSE98 model overview

ECLIPSE's product concept is "Multi In One"

Based on this, we promote product planning and development.
bottom.

The new product is a model change product of the ECLIPSE97 model
Consists of newly launched products.

In model change products, minor changes in design and
Development focused on improving the display part, design and visibility
I tried to improve the quality.

As for newly launched products, in line with the "Multi In One" concept, we
will enhance the in-dash type changer products that allow disc replacement
at hand, as well as increase the screen size.

Standardized TV, 1DIN size audio/TV integrated

Added model items.

2.1 Product concept

The figure below shows the product concept of ECLIPSE.

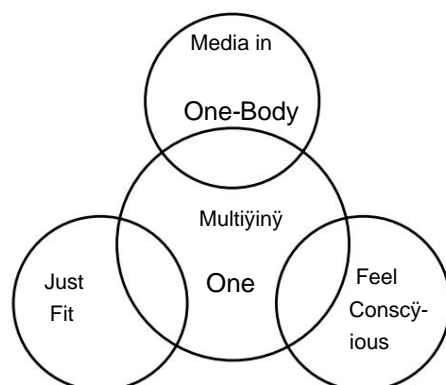


Fig.1 Concept of ECLIPSE

2.1.1 Media In One-Body

In order to realize the new media that are appearing one after another in the limited space in the vehicle, we will make full use of highly integrated technology to integrate media.

2.1.2 Feel Conscious (interface that resonates with the five senses)

In order to make full use of advanced and complicated products in the vehicle interior
What is an interface? From this point of view, we defined the following "five senses". Satisfying these will give the user a sense of comfort.
and contribute to safe driving.

- (1) Hearing: Create sound with the goal of reproducing the original sound in the car,

Provides pure sound. Also a pleasant beep

Operation is assisted by sound.

- (2) Visibility: In addition to increasing the size of the display, the use of icons

and color displays will allow the driver to instantly identify the information they need. In addition, the color tone and layout of the operation buttons

Incorporating this idea into Uto, we plan to review it.

- (3) Tactile sensation: Not only the operation feeling, but also the surface shape of the buttons

that touch the fingertips, the surface treatment that fits the fingers, the operation method, etc.

We create products that are conscious of "touching".

- (4) Experience: high-level access to target media and information

In order to realize it by response, we plan to speed up the CPU. devil
By actively introducing DSP sound, the sense of sound field in the vehicle
enrich the

- (5) Experience: High-quality designs that allow users to feel the joy they have

Equipped with ins and functions. In addition, by directing the fun of using
to create a product that can be worn.

2.1.3 Just Fit (adaptation to evolving moving bodies)

Responding to ever-evolving vehicles with the keywords of environment and safety,
We offer a product group that fits the interior of the vehicle.

for realizing multiple media in a limited space

Along with integrated technology and interfaces that do not interfere with driving, we will develop products that can withstand severe environmental conditions such as vibration, temperature, humidity, and noise.

Starting with a cassette deck mechanism equipped with a non-azimuth guide, a non-contact slip mechanism, and an inner shield head.

As a manufacturer with extensive knowledge of the vehicle environment,

We manufacture products with consistent quality standards, and produce highly reliable products.

The goal is to

The development of ECLIPSE consisted of the above three elements.

Set "Multi In One" as a comprehensive concept

and product development based on the keyword "sensually high performance" proceeded.

2.2 Main product lineup

In the 98 ECLIPSE spring product, AVN 2 model, AV integrated machine 1 model
3 TV models, 10 audio models, 3 speaker models

A total of 19 new products were introduced.

Below is an overview of the main models of the new product. (1)

Navigation Built-in CD/MD AV system E7708AVN (commonly known as

AVN) The "AVN" released last year is equipped with a 5.8-inch widescreen TV, CD, MD, FM/AM tuner, FM multiplex, DSP and graphic equalizer, and 30W x 4 Built-in power amplifier and navigation and was well received. The 98 model also has a differential In addition to improving the accuracy of navigation with a built-in GPS, the ABGS (Active BackGround Screen) is equipped with two modes, Orca and Daylight, to enhance the beauty of the screen.

Equipped with natural images.

(2) Multi-control CD/cassette AV system E3308AVZ

5.8 inch wide TV, CD, cassette, FM/AM tuner,

The 2DIN AV integrated machine, which integrates FM multiplexing and 30W x 4 power amplifiers, has added a convenient pre-in function for Hideaway DSP connection.

(3) Multi-control AV main unit E5508AVT

In the TV sector, we introduced a new 1DIN size AV main unit that combines a 5.8-inch widescreen TV with an FM/AM tuner, FM multiplexer, and a 40W x 4 power amplifier.

It made it possible to build a system.

In addition, a 7-inch wide 1DIN-TV that meets the demand for large screens Added E7708WAV.

(4) Multi-control CD/triple MD main unit

E5508CMD

For MD, a total of 4 discs can be inserted with 3 consecutive performances + 1 disc capable MD changer deck, CD, FM/AM tuner, and DSP , a graphic equalizer, and a 40W x 4 power amplifier. ECLIPSE's first 2DIN audio system was launched.

(5) In-dash 6 continuous CD auto changer E5508ICD

For CD, the first commercial market 1DIN size 6 consecutive CD change Developed a driver, and made it possible to exchange 6 CDs in-dash.

(6) 3WAY twin boat bass reflex type speaker system

E5508BXR

In terms of speaker products, ECLIPSE's first "BOX I put in a speaker. The cabinet uses a special resin with excellent strength and specific gravity characteristics to suppress box noise, and a "twin port duct" is used to more effectively transmit the wave motion of the woofer through two ducts on the left and right sides.

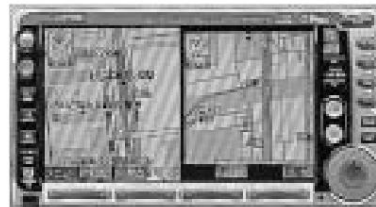
Realized powerful bass reproduction. In addition to the logo illumination

on the back, it is the first commercial product to feature a tweeter on the front.

Illuminations are also placed on the

Finishing up.

<E7708AVN>



<E3308AVZ>



<E5508AVT>



<E5508CMD>



<E5508ICD>



<E5508BXR>



Figure 2 ECLIPSE new product

Fig.2w New models of ECLIPSE

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3.1 Improvement points from the 97 model

In this new ECLIPSE product, as introduced in the previous section, We are adding new items to strengthen our lineup.

However, the following improvements have been made to existing items and improve product competitiveness.

3.1.1 Brushing up the design surface

In 98ECLIPSE, the basic concept of design from 97 model

While inheriting the putto, brush up on the following points and improved the design.

(1) Use of champagne gold color

In the 97 model, the base color of the front plate is "ECLIPSE Sil Bar Metallic" was used, but in the 98 model,

"Campen Gold" is used to create a more luxurious feel.

(2) Cross carbon-like acrylic panel

The acrylic panel on the front panel is completely covered except for the display window.

A loss carbon finish was applied. croc carbon

This material is also used for sing cars and speakers.

In addition, the visual effects reminiscent of chucker flags are also included.

In addition, we aimed for a design that makes you conscious of car audio.



Fig.3 Cross-carbon Style Acrylic panel

(3) New elastomer jog volume

In the 97 model, we aimed for a new analog feel and added a rotary joint.

A large volume was adopted. A thermoplastic elastomer with comfortable touch and non-slip properties and light transmission can be secured.

Can be operated with one finger by using two-color molding of ABS resin

Achieving both comfort and night lighting, 97 model designs

I was able to make it the centerpiece of the inn.

On the 98 model, the elastomer jog volume is further increased

With the goal of further evolution, the following improvements were implemented.

(1) Shape: Suppresses the protruding feeling in the front design and fits better on the finger

We changed the shape as shown in Fig. 4 with the aim of

(2) Lighting line: Conventionally, the lighting bars were arranged radially.

by changing the spiral to

emphasized and made clearer. Also lighter

The color tone is also dark gray to give an image of a smooth operation.

- to light gray.

The improvement of the operation surface as described above and the display part introduced on the next page

Further improvement of man-machine interface with improved visibility

We are trying to improve.

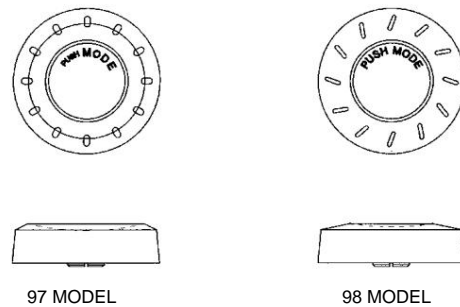


Fig.4 Elastmer jog volume bottom(new and old)

3.1.2 Improved display appearance and visibility

In commercial car AV products, the appearance of the display is designed Competitors are also trying to improve their display

Focusing.

In the 98 model, the basic configuration of the display has changed significantly. However, we have improved the display, so I will introduce it.

(1) Increased brightness of the LCD display of audio products

The brightness of the LCD display part is the backlight part, the LCD panel part, Determined by the front acrylic panel.

Front acrylic panel: Cross carbon introduced in the previous section

I also aimed to emphasize the processing, and removed the acrylic smoke.

This improved the transmittance by about 50%.

(2) LCD panel: The display color has good transmittance and contrast.

Music calendar with high color change

Change the shape of the part or character segment to a shape that is easy to distinguish.

We also improved visibility and appearance.

(3) Backlight: A backlight to achieve the brightness target of the display.

Back-calculate the brightness of the backlight

Stable brightness was ensured by specifying and managing the link.

As a result, the brightness has been improved by 1.5 to 2 times.

(2) Drawing change of visual products

For AVN products, this is a new attempt to replace the spectrum analyzer display.

Although ABGS (Active BackGround Screen) is adopted for

The 98 model has been upgraded to two types of beautiful natural paintings. provided. (Figure 5)

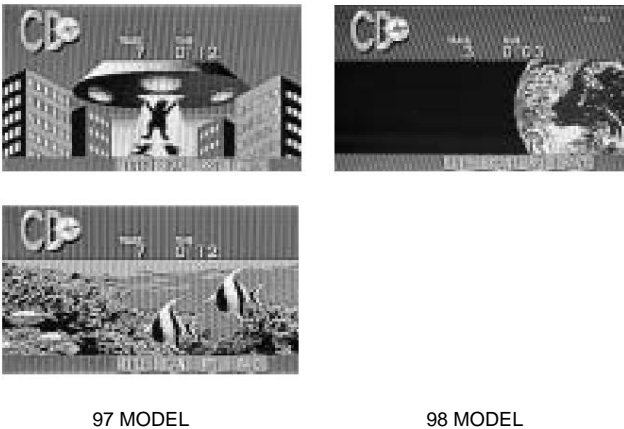


Fig.5 Evolution of ABGS

4. CD/MDC 2DIN integrated machine

4.1 Product Overview

4.1.1 Basic configuration

Figure 6 shows the structural layout, and Figure 7 shows the circuit configuration.

4.1.2 Features

1DIN of conventional CD tuner + MD changer

It is a 2DIN integrated machine that integrates the equipment system, mainly Equipped with the function of

- Large LCD display
- Stepless front tilt
- 3+1 MD changer
- Built-in DSP and EQ
- 40W x 4 high power amplifier
- Built-in position selector

Various display functions

Large LCD and 3 display ICs (segment 174 x common 16)

59 x 15 dot display and graphic equalizer

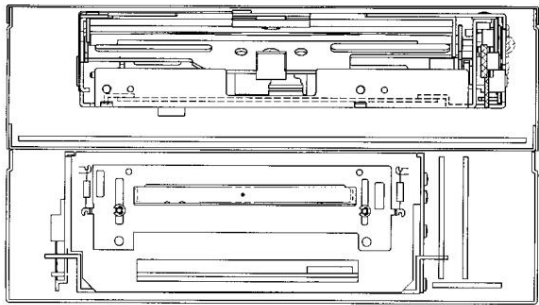


Figure-6 Structural layout diagram
Fig.6 Structure layout

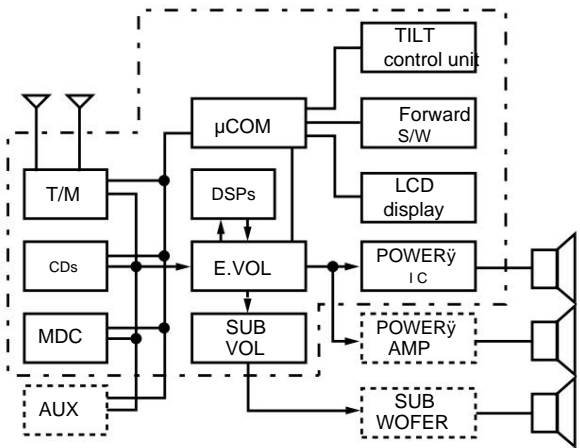


Figure-7 Circuit block diagram
Fig.7 Circuit block diagram

A variety of display functions, including the Katakana table for MD and CD titles in the dot display area Characters such as ships, horses, fireworks, and bulldozers can be displayed, and horizontal and vertical scrolling is possible. (Fig. 8) 4.1.4 Front stepless tilt Front display for improved visibility inside the vehicle A stepless tilt mechanism is adopted for the Corresponds to point variation. The operating mechanism will be described later. section.

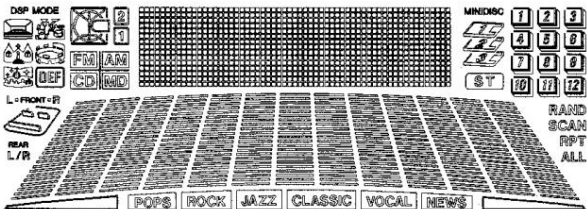


Fig.8 LCD display section

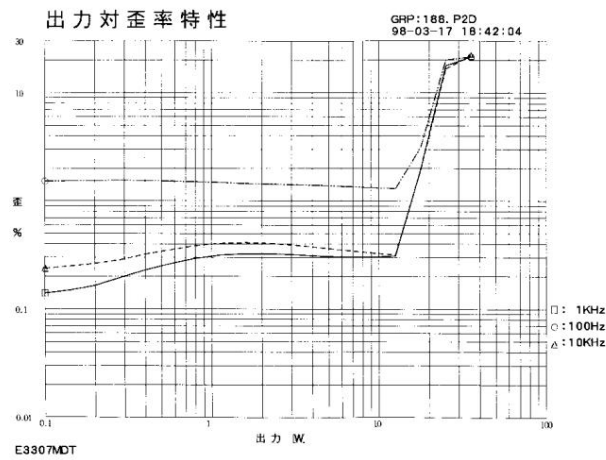
4.1.5 3+1 MD changer

The 3IN1 is equipped with the industry's first MD changer, allowing you to play up to 5 discs including CDs at your fingertips. It is possible.

4.1.6 40W×4 high power amplifier

Built-in high power amplifier with maximum output of 40W x 4 to meet market demand. This gives the rated output (THD 1%)•Practical maximum output (THD10%) improved, high quality I realized the reality sound. (Figure-9)

97 model



98 model

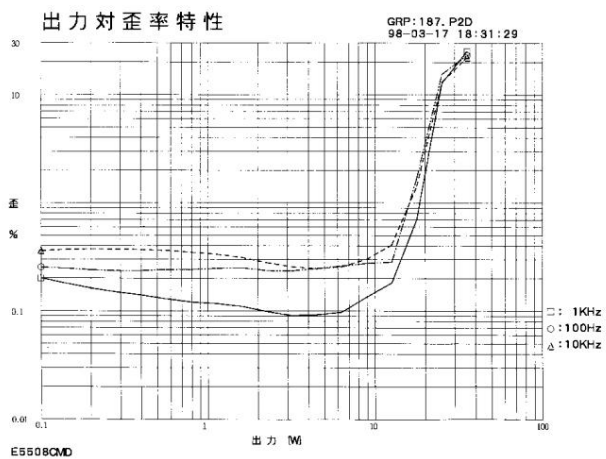


Fig.9 Output level vs distortion characteristics

4.1.7 Built-in DSP/EQ

Conventionally, it was built into the peripheral device and only by system upgrade Built-in DSP/EQ, which was previously available, in the main unit eliminates the need for troublesome connections between devices. (Figure 10) DSP will be described later in another section.

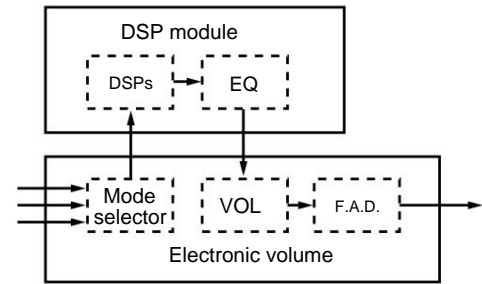


Figure 10 Audio signal flow with built-in DSP
Fig.10 Audio signal processing flow at DSP operated

Table-1 Position Selector - Volume Balance

mode \ output	FR	FL	RR	RL
OFF	0000 (dB)			
FRONT-R	0	-6	-6	-12
FRONT-L	-6	0	-12	-6
FRONT	0	0	-6	-6
REAR	-6	-6	0	0

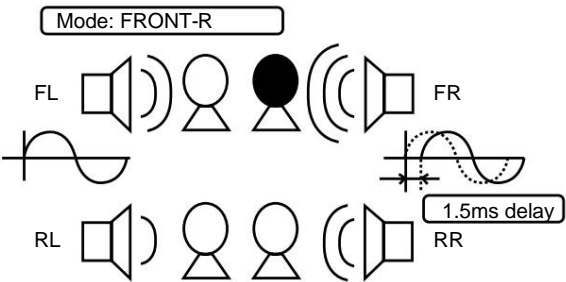


Figure-11 Position selector image diagram
Fig.11 Image of position selector

4.1.8 Position selector

Adjust sound field localization according to the number of drivers and visitors to adjust the volume balance and left/right delay.

Built-in position selector. (Table-1, Figure-11)

4.2 Front tilt mechanism

4.2.1 Front panel opening/closing mechanism

This product has an LCD display with an unprecedented wide area and a drive unit with various operation buttons that are highly operable. Nell and MD Changer, the biggest selling point

The internal structure shown in Fig. 6 is adopted with the aim of coexisting with a CD deck. The design shown in Fig. 12 tells the operation of opening and closing the lower 3/4 drive panel to reveal the MD insertion slot. By the motor gear unit placed in the front right

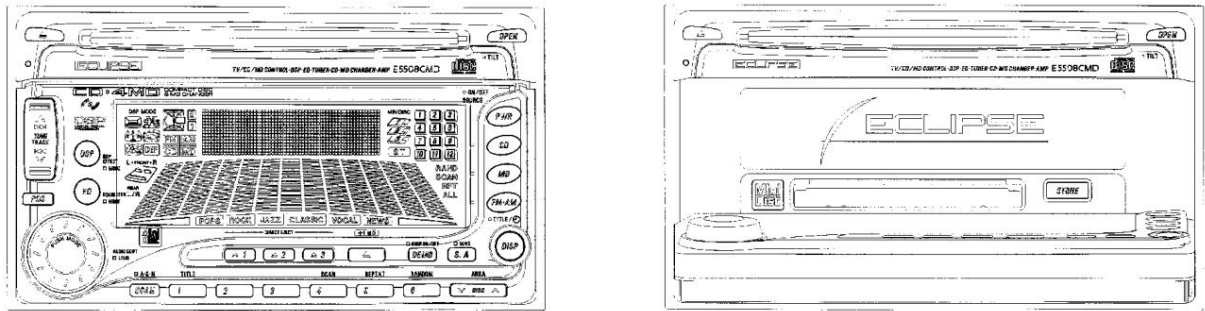


Figure-12 Design drawing
Fig.12 Design

By driving the rack levers on the left and right of the product, the drive power
The shaft protruding from the flannel is attached to both sides of the front body side panel.
Insert the MD cartridge while sliding along the guide groove provided on the card.
The structure allows the panel to be opened and closed to a position where it can be ejected.
be.

4.2.2 Stepless tilt mechanism This product

is equipped with a stepless tilt function to provide the vehicle driver and
passengers with the optimal viewing position for the LCD display. By combining
the above-mentioned panel opening and closing mechanism that employs a
quick-response compact DC motor and a large-capacity 16-bit main
microcomputer, drive control that turns on/off in units of 50ms is achieved.

Realized.

The final tilt detection switch is turned on from the closed position.
14 levels of optional tilt angles up to 30° position
can be set in degrees, and the setting position is sent to the main microcomputer
If memorized, it can be set when power is turned on or immediately after closing the panel.
Automatically return to position. (Fig. 13) 4.3 DSP

function 4.3.1 DSP effect

and EQ adjustment function

Direct sound and effect sound to front and rear 4ch speakers

are mixed to reproduce the acoustic effects unique to each sound field.
DSP processing and optimized frequency response for each music source
DSP module with graphic equalizer function

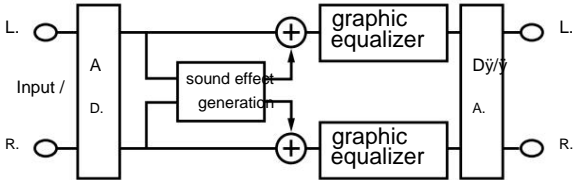


Figure 14 DSP processing flow
Fig.14 DSP processing flow

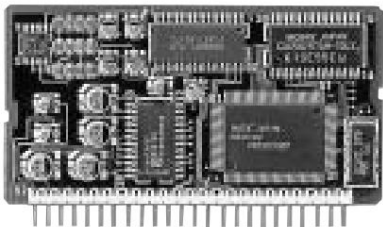


Fig.15 DSP module

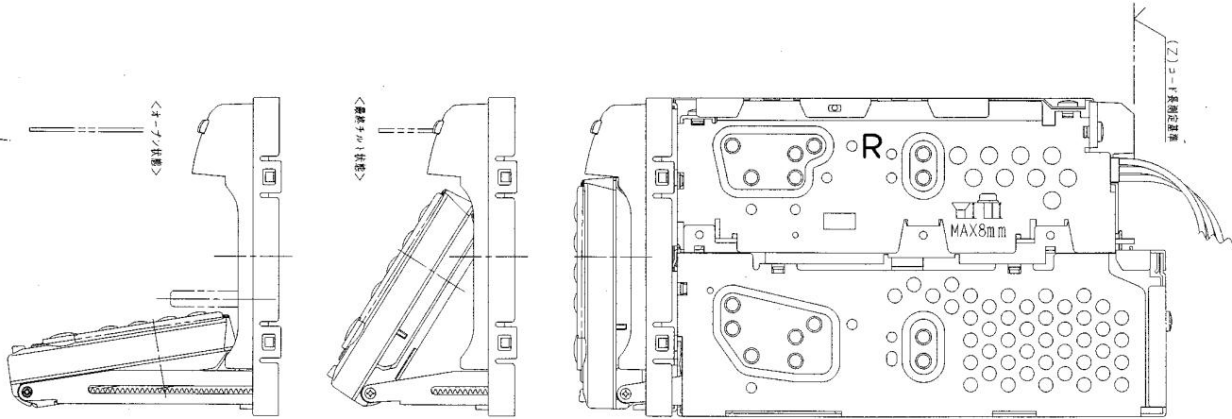


Fig.13 Tilt mechanism

adopted the rule. (Figure 14, Figure 15) DSP 5 modes EQ 6 basic modes

- Concert
- live
- Cathedral
- Stadium
- Disco
- Pops
- rock
- Jazz
- Classic
- vocal
- news

4.3.2 Built-in DSP in main unit

DSP units, which were conventionally built into peripheral devices, have been replaced with main The problem when it is built into the in-unit is the DSP unit It was high-frequency noise generated from Especially FM reception performance greatly affect the

The following measures were implemented this time.

- Main board and DSP board block (power supply board + connection board board + DSP board) are separated and sealed by the housing chassis (Figure 16)
- Connect the GND of the DSP board block to the DSP power supply regulator. and connect to the main board (Fig. 17)
- (3) Deletion of chassis ground for DSP board block

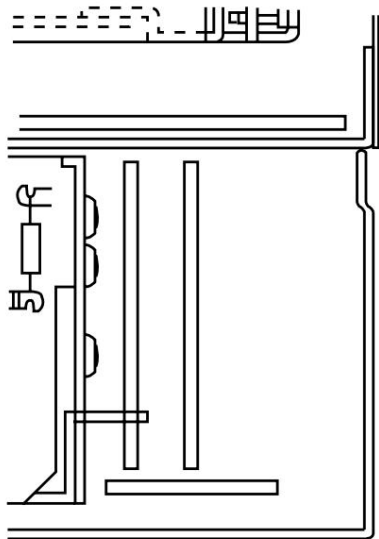


Fig.16 Classis shielding of DSP block

- Add a bypass capacitor to the DSP power supply line on the main board

5. In-dash CD changer

5. 1 Product overview (aim)

5.1.1 User needs

Starting with AM radio, car audio sources are FM radio, cassette tapes, CDs, and TV. Among them, the CD plays a very large role as a source growing up Nevertheless, the CD autochanger The installation position in the vehicle interior is the trunk or under the seat. In places where it would be troublesome to replace a disc, I feel like I'm being bullied.

We have heard from users that they want to be able to change discs at hand like a single CD player, or that there is no space to install a CD autochanger.

Therefore, in order to respond to the above voices, we developed the product described in this paper. was developed. 5. 1.2

New technology

Below are the new technologies for the in-dash CD changer.

- Use of double insertion prevention shutter mechanism
- Adoption of a new mechanism for attaching the front design part

5. 1.3 Features

- The features of the in-dash CD changer are listed below.
- 6 CD discs can be stored in 1 DIN size
 - In-dash type for center console installation
 - Magazine-less slot-in method
 - Operability like a single CD player
 - Insertion/ejection and playback of arbitrary discs
 - Built-in shock protection memory circuit to prevent sound skipping
 - Supports 8 cm CD (compatible with adapter) • Display function that makes it easy to understand the operating status

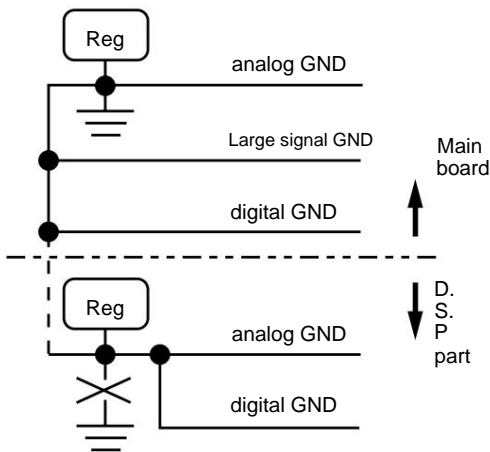


Fig.17 GND connection of DSP section

- Shutter mechanism to prevent double insertion

5. 2 Securing operability and visibility

Set the disc or eject the set disc.

6 buttons for specifying discs, an ejector

One button for project is set.

Also, which stocker inside the deck holds the disc?

or which disc is playing

A total of 12 LEDs are used for display.

In addition, the disk display is placed above the button,

As well as ensuring operability and visibility at the time, buttons

, the button shape, not to mention the character lighting,

The design of the shape improves the feeling when operating the buttons.

I am raising it.

Next, actual operation and display will be described.

First, when you press any button, the indicators on the left and right sides of the CD opening (A) blink, indicating that the disc is inserted OK, the disc is stored in the stocker, and the indicator (B) lights green. , lights orange during play.

The eject operation is performed by pressing the button during play. disk is ejected and the eject button is pressed for 2 seconds. continue to eject all discs being inserted in sequence.

Wear. (Figure 18)

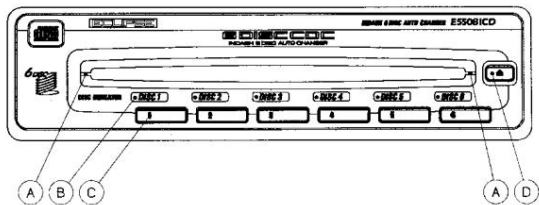


Figure-18 Design drawing
Fig.18 Design

5. 3 Double-insertion prevention mechanism

It was designed to prevent entry.

First, set the levers <E> and <F>, which are shaped to close the CD opening as shown in Fig. 19, so that they can move parallel to the chassis (front plate) of the main unit.

Next, the door opening/closing lever <G> extended from the deck side is applied to the relevant part of the lever <E>, and the lever <E> is slid left and right. By doing so, the jig provided on the lever <F> is aligned with the groove (guide) provided on the lever <E>.

Raise the lever <F> as shown in Figure-20.

Then the disc can be inserted.

In addition, these operations, as introduced in the previous section on operability, do not flash the indicators on the left and right of the CD opening. As long as the lever <F> does not open, It is not possible to insert two discs into the same stocker.

Also, as shown in the figure, it is fixed to the lever <F>.

The specified part <H> is made of resin and is used for CD discs.

against scratches on the disc surface during disc insertion and ejection

It is intended to protect

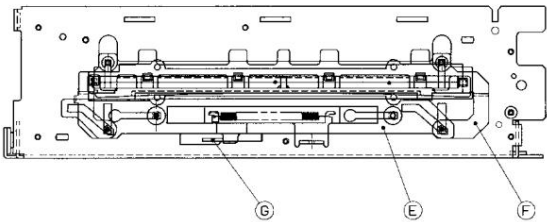


Fig.19 Protecting mechanism of double insertion-1

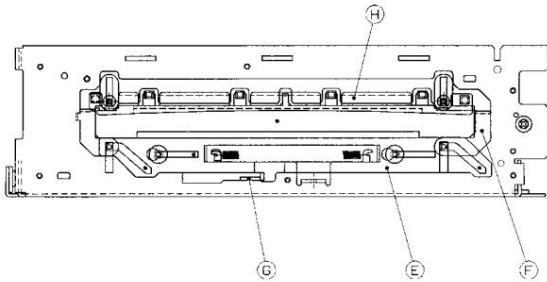


Fig.20 Protecting mechanism of double insertion-2

5.4 New attachment mechanism for front design part

In conventional models, the installation of the front design part (Chassis) side is mainly a structure to be fixed directly, but this The Dash CD changer has a depth different from that of a normal integrated machine. Due to the long dimensions, the depth dimension allowed for the front design part is It will be subject to restrictions, and it usually corresponds to a depth of about 20 mm. However, it was necessary to design with about half the depth dimension.

In addition, in order to incorporate the above-mentioned double insertion prevention mechanism, the front The board must be attached to the chassis side, that's why It has the following structure.

First, as shown in Fig. 21, the resin panel <I> to the chassis, and further Fix the front board <J> to the And finally, the front

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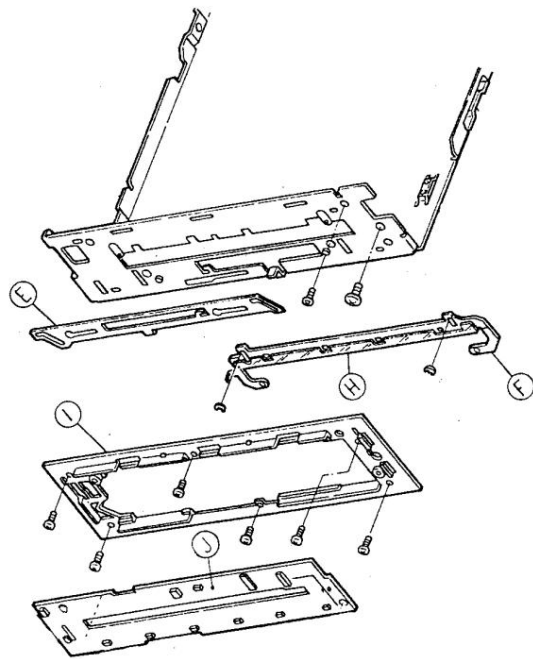


Fig.21 Mounting mechanism
of front panel

The design part is fixed to the panel <I>.

By doing so, the depth dimension of the front design part can be shortened, and a double-insertion prevention mechanism can be established. I was able to

6. in conclusion

The above is an overview of the main products of the ECLIPSE98 model. Solid.

This time as well, we were able to introduce products that differentiated us from other companies. In the commercial market, competitive development of promising new products by competitors is spectacular and unpredictable.

We will continue to develop our original products that will please our customers. We will continue to improve the brand image of ECLIPSE and I would like to contribute to improving the image of the company.

About the author



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